

REMARKS

Applicants thank the Examiner for a thorough review of the present application. Claims 1-3 and 23-24 have been rejected under 35 U.S.C. § 103(a) as being unpatentable as obvious over U.S. Patent 5,657,473 to Killean et al. (the '473 Killean patent) in view of U.S. Patent 5,586,301 (the '301 Fisherman patent). Claims 4-21 and 25-28 have been rejected under 35 U.S.C. § 103(a) as being unpatentable as obvious over U.S. Patent 5,657,473 to Killean et al. (the '473 Killean patent) in view of U.S. Patent 5,586,301 (the '301 Fisherman patent) and further in view of U.S. Patent 6,092,161 to White et al. (the '161 White patent). Claim 22 has been rejected under 37 C.F.R. § 1.75(c) as being of improper dependent form for failing to further limit the subject matter of the previous claim.

In response to the Official Action, Applicants have amended the specification to include section headings. Applicants have amended Claims 1-28 to present the claims in a format typical of U.S. patent applications to improve readability of the claims. Applicants have cancelled Claim 22 and rewritten Claim 22 as newly presented independent Claim 29. Applicants have also amended several claims to more clearly and fully claim the invention as described in the specification.

The Office Action rejects the claims of the present invention in light of the Killean patent, the White patent, and the Fisherman patent. Whereas this document outlines certain key aspects of the Killean and White patents, it primarily addresses, in some depth, the disclosure of the Fisherman patent and responds to the comments made in the Office Action on the individual claims of the application. As explained in more detail below, Applicants respectfully submit that none of the Killean, Fisherman, or White patents, individually or in combination, teach or suggest the claimed invention. As such, the Applicants respectfully traverse the rejections of the claims under § 103(a) and request reconsideration of Claims 1-28 and consideration of Claim 29. Accordingly, Applicants submit that, in light of the remarks presented below, the pending claims of the present application, as amended, are patentability distinct from the cited references and are, therefore, in condition for allowance.

Specification

Applicants have presently submitted several amendments to the specification to include section headings in accordance with 37 C.F.R. § 1.77(b).

Remarks in Response to 103(a) Rejections

Neither the Killean patent nor the White patent provides any teaching on the key aspect of the claims of the protected storage device (PSD) invention, namely the method of implementing the data protection or supervisor functions when the supervisor (data protection scheme) is held in the storage device itself. The Office Action mainly cites the Fisherman patent for this, but as will be noted, the data protection scheme in the Fisherman patent is located on an external board mounted on the computer but not within the storage device. Independent Claims 1 and 23 of the present application refer to "intelligent means" and "interface" to make clear that the term 'storage device' as used in the PSD invention (and the Killean, White and Fisherman patents) refers to a device storing data in a non-volatile way and containing its own electronics card to enable its own operation. A disk drive is such a device. The storage device is intended to be connected to a host computer through some form of interface (*e.g.*, IDE, USB, etc.). It should be noted that the patents cited show embodiments involving a hard disk drive as the storage device and in the following remarks the word 'disk drive' is used for ease of understanding, without intending to limit the present invention to that particular form of storage device.

A. The Killean and White Patents

It is worth reviewing briefly how teachings of the Killean patent (and the White patent) implement data protection or supervision (these terms can be used interchangeably). The Killean patent (and White patent) accomplishes data protection by interposing a separate electronics card between the computer system and its hard disk drive. This separate electronics card holds all the supervising firmware. Any request by the computer system to access the hard disk is first

intercepted by the supervisor card before being passed to the disk drive. If the request is a read or write command the supervisor firmware (managed by a microprocessor on the separate card) controls how the request is implemented on the disk drive, according to a set of pre-selected rules, e.g., a write to a particular file may be disallowed or may be diverted to a separate area and a log kept of this action. The fundamental element of all this is that the computer system cannot deal directly with the disk drive, but must go through the supervisor card. In fact, the supervisor card of the Killean patent (and White patent) is physically interposed between the disk drive controller of the computer system and the disk drive itself. That is, the interface cable to the disk drive is electrically connected to an interface on the supervisor card, instead of the interface on the motherboard. In the Killean patent (and the White patent), provision is also made for the use of a password which enables a user to 'switch-off' the supervising function.

B. The Fisherman Patent

The protection system proposed by the Fisherman patent uses a separate electronics card called the PPSM, which is located within the host computer system connected to the host CPU buses 58, 60, 62, as shown in Figure 2. In operation, after it has successfully initialized itself, the PPSM places itself logically between the CPU and the disk controller 32 by intercepting the requests for access to the hard disk drive that are generated by application programs. However, no part of the protection system, let alone all of it, is physically within the hard disk drive 34 (see the Fisherman patent, col. 4, lines 14-18, col. 9, lines 59-65). Nor is the card interposed electrically between the disk controller 32 and the disk drive 34. Its function, like the supervisor cards of the Killean and White patents, is to 'process' commands that would otherwise, in the absence of the card, be sent directly to the disk drive controller 32. This is a major difference from the operation of a PSD of the present invention. While the intent of the Fisherman patent is in principle similar to the PSD invention (*i.e.* to provide data protection), since the Fisherman patent uses a separate card, its implementation is quite different than the PSD of the present invention, and closer to that of the Killean and White patents.

It may also be noted that the styles of protection offered by the Fisherman patent and the Killean and White patents differ. Dependent claims within the present application incorporate the behavior of the system of the Killean patent as the desired form of protection. For the broader claims of this application, however, the exact form of protection implemented by the supervising means is not specified. It could be of the Killean patent type, of the Fisherman patent type, a hybrid of these, or some completely different type of protection. The present invention, and claims thereto, concerns primarily how such a protection system can be integrated within a storage device and yet controlled from outside the storage device.

As a relevant point of background, it is helpful to review briefly how a computer system, or rather the CPU of a computer system, accesses a disk drive in ordinary operation. This is accomplished by means of a BIOS which is a piece of software, usually resident in the ROM of the computer system motherboard, whose task is to interface with the specific hardware of the system, including the hard disk, so that the CPU itself is not encumbered by the details of accessing the various pieces of hardware. The BIOS contains various software routines, each of which has a specific address and higher-level programs (applications and operating systems) running on the CPU interface with the BIOS routines by means of so-called software interrupts. For each interrupt there is an associated table of the addresses of certain BIOS routines, called an interrupt vector table. These addresses are put into the tables (usually by the BIOS) during the power-up sequence. When the application or operating system wants to use a particular BIOS routine it generates the appropriate software interrupt which in turn looks up the address in its interrupt table and enables the system to jump to the BIOS routine automatically. Thus the system itself does not need to know the individual addresses of all these BIOS routines. In the case of a hard disk access the corresponding interrupt is typically called the Int13h interrupt and provides a gateway for all the commands that the CPU may wish to send to the disk drive. Aspects of the BIOS play an important role in the Fisherman patent.

In broadest terms, the principles employed by Fisherman to load and initialize the protection system are as follows. In ordinary operation, when a typical computer system is switched on, the BIOS begins a sequence of checks, tests, initializations of registers, loading

certain ROM-stored routines, etc. culminating in the start of the boot process and loading of the operating system from the hard disk. One of these tests is called the Power-On Self-Test, or POST for short. In a system with a supervisor card of the Fisherman patent installed, the card also becomes active when the computer system is switched on, and during the POST sequence, specifically at the time of the ROM-scan procedure, the protection software on the card takes control, prompts the user for user-identification, and sets itself up in accordance with the access rights available to that user. (This is a complicated operation involving reading some 'data structure' information from the hard disk, forming a 'virtual disk' unique to that user, and other attributes, none of which is directly relevant to the distinction between the Fisherman patent and the present invention).

The description of this initialization process begins in the Fisherman patent at column 5, line 50. Similar description is provided at column 9, lines 59-65. Applicants note that it is not explained in the Fisherman patent *how* the protection software takes control, or whether the BIOS has to be modified to permit the protection software to take control. When initialization has been done, the card alters a key address (namely the disk request handler of the BIOS) in the interrupt vector table of the BIOS and replaces it with the address of a "key program" stored on the card (namely a disk request handler of the protection system). At this point, control is returned to the POST routine within the BIOS. After the POST is completed, the operating system is loaded from the disk to the computer system, presumably in a conventional manner. Thereafter, all disk requests are delivered to the supervisor card (PPSM) of the Fisherman patent and executed under the supervision of the protection system. For each request received, the protection routines on the card analyze exactly what the request consists of and in particular whether it is permissible, according to the access rights already established for the user. If the request is valid, the original disk-request handler address is called and the request is carried out on the disk. If it is not valid, the card returns an appropriate error message and does not carry out the request. After each request, valid or not, control is returned to the card by means of a routine on the card re-entering the key program address in the vector interrupt table. Thus, the protection system is always 'in charge'.

C. Protected Storage Device Present Invention

The present invention provides a storage device and method for a protected storage device that includes a supervisor means with the storage device, rather than as a separate element of the computer system such as by way of a printed circuit board for a supervisor card external to the storage device. The mechanism involved in the present PSD invention is quite different from the Fisherman patent, even though the ultimate purpose is very similar. The invention requires no separate card with its own processor, ROM, RAM, and access to the disk interface. Thus, on power-on, the concept of establishing a protection on a card, separate from the CPU of the computer system and the disk drive, has no meaning. Instead, protection is set up *within the disk drive itself* in a manner where the processor, ROM, and RAM incorporated in the disk drive are programmed to carry out the desired protection functions. This protection is both initialized and subjected to user control as follows. On power-on, the BIOS carries out its usual procedures and comes to the point of loading the operating system from the disk. In a normal system, this is accomplished by firstly transferring the 'master boot record' located at the start of the first sector on the disk. This 'record' contains code which is processed by the CPU and which initiates the loading of the operating system from the disk to the RAM in the computer system. In the present PSD invention, the ROM of the disk drive may be provided with appropriate firmware which intercepts the request for the master boot record and returns instead a piece of code, called a loader. The CPU processes the loader whose sole function is to instruct the transfer of further code (supervisor code) from a part of the disk which, in the preferred embodiment, is hidden in normal operation. This 'supervisor' code is transferred and executed and enables protection system information to be shown on the screen to solicit a response from the user (*e.g.*, the user can choose whether to enable protection, and if so, which disk areas to protect). Once the user responds, the supervisor code concludes by transferring the originally-requested master boot record, and the computer system re-enters the process of transferring the operating system. At this point, the protection or supervising capability has been successfully enabled.

Thereafter, with the protection system selected (active), all requests received by the disk drive are subject to the rules of access, etc. defined by the protection system prior to being implemented, or not, by the disk drive. The protection system uses the disk drive processor acting on the routines held in the disk drive ROM for its functionality. In addition, the protection system protects itself and cannot be interfered with, modified, or switched-off by the CPU of the computer system.

In summary, some of the benefits of the present PSD invention are that

- (1) the supervisor firmware is active and 'in charge' prior to loading the operating system and before the start of any disk operations;
- (2) because the micro-processor and supervising firmware are resident in the disk drive, the user or host system cannot interfere in any way with the supervising functions;
- (3) no hardware card separate from the disk drive is required to implement and control the same protection functions as are provided in the Killean, White, and Fisherman patents;
- (4) there is no processing overhead in the host computer system, once the protection has been set up; and
- (5) no modification of the standard computer system components, including the BIOS firmware, is required to load and configure the protection.

D. Claims

In this section Applicants address the specific comments made in the Office Action with respect to the claims of the present application.

Claim 1

Applicants submit that the Killean patent does not teach or disclose the limitation of Claim 1 of

the storage means comprising: ... non-volatile read-only-memory (ROM) means for storing firmware for controlling operation of the storage device; and volatile random-access-memory (RAM) means.

The storage means of Claim 1 is part of the storage device, not part of the host computer system or a separate supervisor within the host computer system. Column 6, lines 22-30 of the Killean patent cited on page 2 of the Office Action refers to ROM and RAM resident in the Supervisor. The Supervisor, as described in the Killean patent (*see, e.g.*, Fig. 1; col 3, lines 21-23; col. 5, lines 46-49) is a separate electronics card, *i.e.* the ROM and RAM are not part of the storage means within the storage device. Accordingly, the Killean patent does not teach the above-recited limitation of independent Claim 1.

Page 3 of the Office Action acknowledges that the Killean patent fails to explicitly teach a number of further elements of Claim 1, but cites the Fisherman patent in relation to these elements. Taking each element in turn, the following remarks are provided:

- 'a boot sector containing code for use by the host computer system to perform operating system boot of the host computer system' This element refers to the standard method of loading an operating system. The boot sector of a typical disk drive contains code, which is transferred to the host computer where it is executed and instructs the host computer to request the disk drive to transfer the operating system into host system memory. This wording is altered slightly by the present amendment, but only to clarify the scope of the claim and not for reasons related to patentability over the cited references. The language has been amended to read, "a boot sector where the host computer system seeks code to perform operating system boot of the host computer system."
- 'wherein supervising means is incorporated in said storage means so as to protect information stored in the storage medium' The feature claimed is "supervising means is

incorporated in said storage means *for operating said intelligent means* so as to protect information stored in the storage medium” (emphasis added). The “intelligent means” is earlier defined to be the within the storage device itself. The Office Action cites column 4, lines 7-10 of the Fisherman patent. However, this citation states that “The set of protection programs is stored in the hard disk 34 and in the PPSM 22. In particular, the protection control program 50 is stored as an ordinary file on the hard disk 34. The other protection programs are stored in the PPSM 22.” Figure 2 of the Fisherman patent shows how the PPSM comprises various memory and processing elements 66-76 connected to the bus within the host computer (*see* col. 4, lines 11-22). These various memory and processing elements 66-67 are not part of the hard disk drive 34, and are not even connected between the hard disk controller 32 and the disk drive 34. The various programs stored in the PPSM control only the separate processor of the PPSM itself. In other words, the supervising means in the Fisherman patent is not incorporated in the storage device and does not operate by controlling the “intelligent means” within the storage device 34.

- ‘and wherein the storage device further includes: a host executable code segment, stored in the said storage means, for allowing user control of the supervising means via the host computer system and for controlling initiation of operating system boot in the host computer system’ The Office Action cites column 5, line 37 to column 6 line 67 of the Fisherman patent with respect to this claim limitation. The cited section provides a general outline of how the Fisherman patent works. It is noted above that part of the protection scheme (the protection control program 50) in the Fisherman patent is stored in the storage means (disk drive 34), but the key programs required to set up the protection system are held in the PPSM (*e.g.*, 44 and 52). The protection control program is used to change attributes of a user (*e.g.*, add a user, delete a user, change a user name, change a password, etc.; *see* col. 13, lines 60-67).

At column 6, lines 29-25 the Fisherman patent states that “after the interrupt vector has been changed, control is returned to POST (part of the BIOS start-up

procedure) through the initial key program 52 ... and the operating system is loaded.” It is the PPSM (and its processor), which makes changes to the addresses in the interrupt table, and it is a PPSM program (44) which returns the computer to the POST procedure, which then enables the BIOS to follow its usual course leading up to the loading of the operating system. There is no “host executable code element” stored in the storage device which is involved in “controlling initiation of operating system boot in the host computer system” as recited in Claim 1.

- ‘and loader means stored in the storage means and comprising host executable code for loading said code segment to the host computer system and causing the host computer system to execute the loaded code segment’ The Office Action cites column 6, line 43 to column 7, line 2 and Figure 1 of the Fisherman patent with respect to this claim limitation. However, there is nothing in this citation that speaks to this claim limitation. There is no mention of a “loader means” (or equivalent thereof), no mention of “host executable code” (or equivalent thereof), no mention of “loading code segment to the host computer system” (or equivalent thereof), and no mention of the “host computer system executing the loaded code segment” (or equivalent thereof). In column 6, lines 43-48, the HDPS disk-request handler 46, which resides in the PPSM card, receives a “set of parameters of the requested disk operation.” This ‘set’ comes from the host system and is a normal part of a command to access a disk drive. The rest of the citation, column 6, line 50 to column 7, line 2, describes how the protection system analyses a requested operation and how it acts in relation to this analysis. This is part of normal operation of the supervisor and is not concerned with how the supervisor is activated. This function is carried out by the processor and programs on the PPSM and does not require action either from the host system or the storage device. Finally, there is nothing in Figure 1 that speaks to this part of Claim 1, as Figure 1 merely depicts the logical structure of the HDPS after it has been set up. Applicants respectfully remind the Examiner that the ‘storage means’ of Claim 1 is defined to be within the storage device. The programs which are responsible for initializing protection in the Fisherman patent are the initial key program 52 and protection initialization program 44 (Col 5, 51-53). Even

if it were considered that these correspond in function to the loader means of the present claim, they are stored within the PPSM, not on the hard disk nor anywhere else within the storage device 34.

- 'and wherein said supervising firmware stored in the ROM means is adapted to intercept any request for said boot sector, issued by the host system in use thereof and to supply said loader means to the host computer system to satisfy the request' The Office Action cites column 3, line 50 to column 4, line 58 of the Fisherman patent with respect to this claim limitation. However, nowhere in this citation is there any reference to a request from the host system for a boot sector, a boot sector, the supply of a loader means (or equivalent thereof), or loader means. Furthermore, the ROM means in the claim limitation is located in the storage means (disk drive) whereas, in the Fisherman patent the 'supervising firmware' is stored in the PPSM (a separate card). What the Fisherman patent does do is intercept all commands from the host to the disk drive by having the PPSM change a key address in the interrupt vector table of the BIOS to the address of a routine in the PPSM, thereby allowing the PPSM to analyze this command and act on its findings (*see col. 3, lines 51 to 63*). The remainder of the citation, column 3 line 64 to column 4, line 58, describes in broad outline how the PPSM works *once it has been initialized and configured by a user* and the elements of the PPSM. Reference is made in this citation to the host, or rather to the CPU 64 of the host, in column 4, lines 18-26 and 37-44. These references describe how the CPU interacts with the PPSM, in particular with memory chips 66 and 68, and how the CPU helps to set the PPSM to active mode or passive mode. At no point does the Fisherman patent address the above claim limitation. As described at column 5, line 51 and column 9, lines 63-65, the initial key program 52 and protection initialization program 44 of the Fisherman patent, located on the PPSM card, are given control at some point during the BIOS ROM-scan procedure some time before the boot sector is requested at the end of the BIOS self-test. Even if the PPSM of the Fisherman patent does intercept the boot sector request, it does not substitute the loader in the manner claimed.

On page 4 of the Office Action, following citation to the Fisherman patent in relation to the various elements of Claim 1, the Office Action argues that “it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teachings of Killean and Fisherman” to effectively meet all the elements of Claim 1 of the PSD application. Certainly the skilled person could be expected to compare and contrast the different schemes described in these documents, and consider whether elements of them could be combined to make some new system. However, for the reasons detailed above, no combination of their features or teachings approach the limiting features of the present claims which distinguish the claims from the Killean, Fisherman, and White patents. The present invention alone provides a mechanism for loading and configuring the protection programs prior to booting the operating system when the supervising means is contained entirely within the storage device and so cannot take control of the system at an earlier stage. The Fisherman patent offers no clue as to how one might do this. Specifically, there is no teaching of

- interception within the storage device of a request for a boot sector;
- supplying a loader means in place of the boot sector; or
- causing execution by the host of a code segment relating to the protection system.

Accordingly, Applicants submit that independent Claim 1, and claims depending therefrom, include recitations which patentably distinguish the claimed invention over the cited references and are, therefore, in condition for allowance.

Claim 2

Claim 2 depends from independent Claim 1, and for the reasons stated above with respect to Claim 1, Applicants submit that the rejection of Claim 2 should be withdrawn. Further, with respect to Claim 2, the Office Action states that “Fisherman teaches a storage device, wherein the supervising means is provided wholly as firmware which is stored in said non-volatile ROM means on the storage device. (See col. 4 lines 34-56).” Applicants submit that this statement of the Office Action is incorrect. The citation states clearly that ‘The PPSM 22 comprises a first memory 66, a second memory 68, a programmable controller 70, and a program discriminator 72.’ The PPSM is not the storage device or on the storage device, the PPSM is a separate card

(see Fig. 2; col. 4, lines 14-15 *stating* “As shown in Fig 2, the PPSM comprises an external board connected to the system bus”). It is clear from Fig 2 that the PPSM is connected through the external system board to the other elements of the host system including the CPU and the hard disk controller 32 and that the PPSM is not the storage device or on the storage device as recited in Claim 2. The hard disk drive 34 is at the other side of the disk controller.

Claim 3

Claim 3 depends from independent Claim 1, and for the reasons stated above with respect to Claim 1, Applicants submit that the rejection of Claim 3 should be withdrawn. Further, Claim 3 includes “the intelligent means comprises a microcontroller which runs the supervising firmware stored in the ROM means.” Inspection of Figure 1 of the application shows that the microcontroller (7) and ROM means (4) are resident in the disk drive. The Office Action states that “Fisherman further discloses a hard-disk controller within the computer system, which reads (sic) micro-controller. (Col 3 lines 41-50).” While a hard-disk controller may communicate with a microcontroller of a disk drive, this does not correspond or relate to the limitation of Claim 3. Figure 2 of the Fisherman patent shows the hard-disk controller 32, which runs the supervising firmware, to be a part of the host system and separate from the disk drive 34. The firmware within the disk drive 34 in the Fisherman patent is not described, and performs no part of the supervising function.

Claim 23

Claim 23 is a method of controlling access to and modification of information stored on a storage medium of a storage device. The method recites limitations corresponding to limitations discussed above with respect to independent system Claim 1. Accordingly, for the reasons stated above with respect to Claim 1, Applicants submit that the rejection of Claim 23, and claims depending therefrom, should be withdrawn.

Claims 22 and 29

Claim 22 has been cancelled and rewritten as independent Claim 29. Newly added independent Claim 29 recites limitations corresponding to limitations discussed above with

respect to independent system Claim 1. Accordingly, for the reasons stated above with respect to Claim 1, Applicants submit that Claim 29 is in condition for allowance.

Claims 4-21 and 24-28

Each of Claims 4-21 and 24-28 depended from Claim 1 and Claim 23, respectively. Accordingly, Applicants submit that Claims 4-21 and 24-28 are in condition for allowance in light of the reasons stated above with respect to Claim 1. Provide below are additional comments made to correct and/or clarify misunderstandings and/or misrepresentations of the cited references with respect to the indicated claims. These additional comments provide further reasons why these claims are in condition for allowance.

Claim 24

Applicants respectfully refute the comment in the Office Action that "Killean discloses [that] the code segment, when executed, initiates a user interface procedure whereby a user may select a protection option." There is no code segment or no code segment which transfers a boot program disclosed in the Killean patent. The citation from the Killean patent to column 4, lines 1-60 describes how the Supervisor treats partitions on the disk and sets various access rights to these partitions and provides choices to a user of which partition to select. This citation does not discuss code segments or transferring boot sectors as recited by Claim 24.

Claim 5

Applicants respectfully submit that the Office Action is mistaken in citing the White patent with regard to "firmware stored on the ROM means of the storage device." In the White patent, the ROM means is not located in the storage means but in the Supervisor, which is a separate card (*see* Fig. 7 where the elements of the Supervisor are depicted, in particular the interface (318) to the drive and the interface (310) to the Personal Computer). Also, the White patent at column 10, lines 24-32 states, "The Supervisor provides a typical hard disk adaptor card interface 310 to a motherboard of a personal computer or the like and ROM 312."

Claim 8

The White patent does not teach a Sector Relocation Table (SRT) held in “said volatile RAM means (5) of the storage device (1)” but rather in the Supervisor card as discussed above with respect to Claim 5.

Claim 10

As noted above with respect to Claim 1, the Fisherman patent does not teach or describe a ‘loader means’ (or equivalent thereof) provided from the storage device.

Claims 11 and 12

The White patent does not teach or describe a ‘loader means’ (or equivalent thereof), either in non-volatile ROM or in the storage device. The first citation to the White patent, column 6, lines 13-22, refers to a dedicated area reserved in the storage medium, inaccessible to the user. This is used by the supervising firmware for storing data that is changed or amended by a user or original data that is moved. The second citation to the White patent, column 7, lines 57-62, refers to the action, under the control of the supervising firmware, of writing back original data from the dedicated area to the original location of this data on the storage device. There is no reference in these citations to a loader means. The concept of a loader means plays no part in the White patent.

Claim 13

The Fisherman patent does not teach or disclose “a storage device wherein the code segment is provided in said non-volatile ROM means of the storage device.” The Office Action cites column 5, lines 45-50 of the Fisherman patent; however, this citation refers to the PPSM 22 and access to the EPROM and RAM of the first memory 66 of the PPSM. As stated above with respect to Claim 1, the PPSM is a separate circuit board. Furthermore, no part of the Fisherman patent teaches or discloses a “non-volatile ROM means of the storage device.”

Claim 14

In addition to the remarks presented above with respect to Claims 11 and 12, the White patent does not teach or disclose a 'code segment' (or equivalent thereof). The White patent describes a dedicated area, but this dedicated area has nothing to do with a code segment. The dedicated area stores changes to data files or parts of data files from the accessible part of the disk.

Claim 17

There is no reference in the White patent to "said loader means is provided in at least one reserved track of said at least one disk platter" nor, as noted in the remarks with respect to Claims 11 and 12, any reference to a "loader means." The Office Action cites column 7, lines 56-61 of the White patent to this effect, but this citation simply refers to "space that will be inaccessible to the user is reserved on the storage medium." The purpose of this space (dedicated area) is discussed above with respect to Claims 11 and 12 and Claim 14.

Claim 27

In addition to the remarks presented above with respect to Claim 8, the relevant 'volatile RAM means' is recited as being located in the storage device, which is not the case in the Killean, Fisherman, or White patent.

E. Conclusion

The Fisherman patent does not remedy the deficiencies in the Killean and White patents that would allow the supervisor to be implemented within the existing hardware of a disk drive or similar storage device. On the contrary, the Fisherman patent relies on a separate hardware card which gets control of the host system prior to operating system boot. The protection scheme of the Fisherman patent cannot be implemented directly in an integrated protected storage device because the storage device does not necessarily receive any communication from the host until operating system boot sector is requested.

In view of the remarks presented above, it is respectfully submitted that the present claims are in condition for immediate allowance. It is therefore respectfully requested that a

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Notice of Allowance be issued. The Examiner is encouraged to contact Applicants' undersigned attorney to resolve any remaining issues in order to expedite examination of the present invention.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper, such as the fees for the addition of Claims 23-29. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,

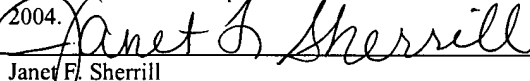


Christopher J. Gegg
Registration No. 50,857

Customer No. 00826
ALSTON & BIRD LLP
Bank of America Plaza
101 South Tryon Street, Suite 4000
Charlotte, NC 28280-4000
Tel Charlotte Office (704) 444-1000
Fax Charlotte Office (704) 444-1111
CLT01/4681150v1

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Janet F. Sherrill